Application No.: 09/601,515 Docket No.: 20162-00564-US

REMARKS

Claims 1-35 are pending in the application. Favorable reconsideration of the application is requested.

Kindly approve the amendment of Figs. 1-4 as shown in the enclosed proposed drawing corrections.

Withdrawal of the objection to the specification is requested in light of the foregoing amendments.

Withdrawal of the objection of the claims based on certain informalities noted in the Office Action is requested in light of the amendments made hereto.

Withdrawal of the rejection of the claims under 35 U.S.C. § 102(e) as being anticipated by Aarts et al. (U.S. Pat. No. 6,111,960) is requested. The present invention is directed to an apparatus which boosts the output signal of a bass musical instrument. The apparatus defined by claim 1 includes a bandpass filter to select a frequency band of the audio signal to be boosted. A distortion applying means derives a non-linear distortion signal from the selected frequency band signal. The distortion component is added back to the input audio signal.

The bandpass filter means is advantageously selected to have a low frequency cut-off which is 50 - 300Hz, and a high frequency cut-off which is in the range of 200 - 450Hz. A filter passes only a double-numbered overtone component of a fundamental tone of the bass musical instrument, and suppresses the signal frequencies lower than or equal to the fundamental tone as well as those above the double-numbered overtone.

In this way, the double-numbered overtone components are selected for combining with the audio signal to boost the output signal.

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Turning now to the distorter of the Aarts et al. (U.S. Pat. No. 6,111,960) device, a system is disclosed which scales generated harmonics in response to a detected level of an audio signal. The harmonics are scaled properly, so that the non-linear behavior or the harmonic generator is compensated. Thus, any non-linear device which is used as a harmonic generator will have the ratio of amplitudes of the various harmonics maintained constant independent of an input signal level.

The present invention is specific to providing boost to a bass signal. Accordingly to the present invention, a frequency region of the fundamental tone of a bass musical instrument is boosted or lowered is suppressed, to select only the overtone component of the fundamental tone. In reviewing the cited art reference, there is no disclosure of this feature.

While Aarts et al. (U.S. Pat. No. 6,111,960) uses a harmonic generator, there is no indication that the filter selects a harmonic overtone component. Accordingly to the present invention, an even numbered overtone of the fundamental tone is boosted.

In view of these distinctions favorable reconsideration is requested.

Withdrawal of the rejection of claims 18, 19, 28 and 32-34 under 35 U.S.C. § 102(e) as being anticipated by Jackson (U.S. Pat. No. 6,504,935) is requested. The Jackson (U.S. Pat. No. 6,504,935) reference is directed to creating harmonic distortion in signals which may be digitally processed, to restore them to a condition representing analog devices, such as vacuum tubes, transducers, etc. which would create such a signal. The harmonic distortion derived from the Jackson (U.S. Pat. No. 6,504,935) device is determined first from a model representing the desired harmonic characteristics of a desired distortion. The distortion model is then used to synthesize distortion characteristics for imparting to a signal which is virtually identical to that produced by the device which was used to create the model.

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The reference does not suggest any way of providing boost to a base signal, as is provided by the rejected claims. Specifically, it does not disclose selecting a component corresponding to a double or higher overtone, and they applying distortion to the component. Further, rejected claims 19 requires that the distortion applying means have a non-linear response which is S-shaped, having no point of symmetry with respect to a reference point of an input-output function. It is not seen where Jackson (U.S. Pat. No. 6,504,935) provides any such function.

Withdrawal of the rejection of claim 2 as being unpatentable over Aarts (U.S. Pat. No. 6,111,960) in view of Iwamatsu (U.S. Pat. No. 5,040,220) is requested. Iwamatsu (U.S. Pat. No. 5,040,220) describes a type of control circuit which permits sound field effects to be introduced into a signal. Previously stored ready made sound field patterns which describe a desired sound field are combined with an audio signal to give the effect of a specific sound field.

In reviewing the reference, there does not appear to be disclosed any feature for providing boost to a bass signal. Claim 2 is specific to a filter response which has a skirt which will allow a fundamental tone component of a bass musical instrument to be passed at a reduced level. This subject matter in combination with claim 1 will provide a particular boost effect to a base signal. As Iwamatsu (U.S. Pat. No. 5,040,220) fails to disclose any such control over a bass signal, it is not seen how it can suggest the subject matter of claim 2.

Withdrawal of the rejection of claim 3 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) and further in view of Tanaka et al. (U.S. Pat. No. 5,850,460) is requested. Claim 3 is dependent on claim 1 and carries all the limitations thereof.

Withdrawal of the rejection of claim 4 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) in view of Gaulder (U.S. Pat. No. 4,135,590) is requested. Claim 4 carries all the limitations of claim 1 and is therefore considered to be allowable over the cited combination of references.

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Withdrawal of the rejection claim 5 under 35 U.S.C. § 103 as being unpatentable over the combination of Aarts et al. (U.S. Pat. No. 6,111,960) and Gaulder (U.S. Pat. No. 4,135,590), further in view of Iwamatsu (U.S. Pat. No. 5,040,220), is requested. Claim 5 is also dependent on claim 1 and carries all the limitations thereof.

Withdrawal of the rejection of claim 9 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) in view of Iwamatsu (U.S. Pat. No. 5,040,220), is requested. Claim 9 is dependent on claim 1 and is therefore believed to be allowable.

Withdrawal of the rejection of claims 12 and 13 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) in view of Jackson (U.S. Pat. No. 6,504,935), is requested. As was noted previously, Jackson (U.S. Pat. No. 6,504,935) does not provide for any control over boosting the bass signal, and is directed to modeling a device so that the distortion of the device can be reproduced and added to a signal. This does not disclose or suggest the subject matter of claim 1, or claims 12 and 13 dependent thereon.

Withdrawal of the rejection of claim 14 under 35 U.S.C. § 103 as being unpatentable over the combination of Aarts et al. (U.S. Pat. No. 6,111,960) and Jackson (U.S. Pat. No. 6,504,935) and further in view of Gummel (U.S. Pat. No. 3,683,417) is requested. Claim 14 is dependent on claim 1 and carries all the limitations thereof.

Withdrawal of the rejection of claim 16 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No., 6,111,960) in view of Tanaka et al. (U.S. Pat. No. 5,850,460), is requested. Claim 16 is dependent on claim 15. As noted previously, claim 15 requires a narrow bandpass filter for selecting a double overtone component of a desired fundamental tone of a bass signal from an audio signal. This double overtone signal is then distorted. In reviewing the cited reference, there does not appear to be suggestion of a device which will select a double overtone component of a desired fundamental tone and distort this component. Accordingly, it is not seen how Aarts et al. (U.S. Pat. No. 6,111,960), or Tanaka et al. (U.S. Pat. No. 5,850,460) which does not disclose or suggest the foregoing limitations for selecting a double overtone can when combined yield or suggest this subject matter.

Withdrawal of the rejection of claim 17 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) as applied to claim 15 in view of Jackson (U.S. Pat. No. 6,504,935) is requested. Claim 17 carries all the limitations as claim 15 and is therefore believed to be allowable.

Withdrawal of the rejection of claim 20 under 35 U.S.C. § 103 as being unpatentable over Jackson (U.S. Pat. No. 6,504,935) as applied to claim 18 in view of Tanaka et al. (U.S. Pat. No. 5,850,460) is requested. Claim 20 is dependent on claim 1 and carries all the limitations thereof.

Withdrawal of the rejection of claim 21 under 35 U.S.C. § 103 as being unpatentable over Jackson (U.S. Pat. No. 6,504,935) as applied to claim 18, further in view of Iwamatsu (U.S. Pat. No. 5,040,220) is requested. Claim 21 is dependent on claim 15, and carries all the limitations thereof which as noted previously, is not disclosed or suggested in the references of the rejection.

Withdrawal of the rejection of claim 26 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) in view of Iwamatsu (U.S. Pat. No. 5,040,220) is requested. Claim 26 carries all the limitations of claim 24. Claim 24, similar to claim 15, requires that a component corresponding to a double overtone frequency region of a bass musical instrument be selected. The selected signal is then subject to a non-linear distortion.

In reviewing the cited references, it is not seen where they can suggest the selection of a double overtone signal and therefore do not disclose those limitations related to selection of a double overtone signal.

Withdrawal of the rejection of claim 27 under 35 U.S.C. § 103 as being unpatentable over Aarts et al. (U.S. Pat. No. 6,111,960) and Iwamatsu (U.S. Pat. No. 5,040,220) in view of Jackson (U.S. Pat. No. 6,504,935) is requested. Claim 27 is dependent on claim 24 and carries all the limitations thereof.

Withdrawal of the rejection of claims 29, 30 and 35 under 35 U.S.C. § 103 as being unpatentable over Jackson (U.S. Pat. No. 6,504,935) and further in view of Aarts et al. (U.S. Pat. No. 6,111,960) and Iwamatsu (U.S. Pat. No. 5,040,220) is requested. Claims 29, 30 and 31 are dependent on claim 28. Claim 28 carries the limitations of a filter for selecting a component

corresponding to a double overtone region of a bass instrument. Distortion processing then is applied to the selected component.

None of the references appear to disclose the process of selecting a double overtone region of a bass musical instrument. Accordingly, it is not seen how they can be combined in way to render obvious this subject matter.

Withdrawal of the rejection of claims 31 as being unpatentable over Hahne (U.S. Pat. No. 4,797,933) is requested. Claim 31 is dependent on claim 28 and carries all the limitations thereof.

It is submitted that none of the references cited in the Office Action include those features of applications claims which provide for selecting a double overtone signal in a bass signal. The further processing of this component is not disclosed in the references and therefore the references cannot be combined in a way to rendered obvious or anticipate this subject matter.

In the event that the Examiner considers that any further cooperation with the undersigned will expedite prosecution of this subject matter, he is urged to contact the undersigned at the telephone number below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 20162-00564-US from which the undersigned is authorized to draw.

Dated: January 5, 2004

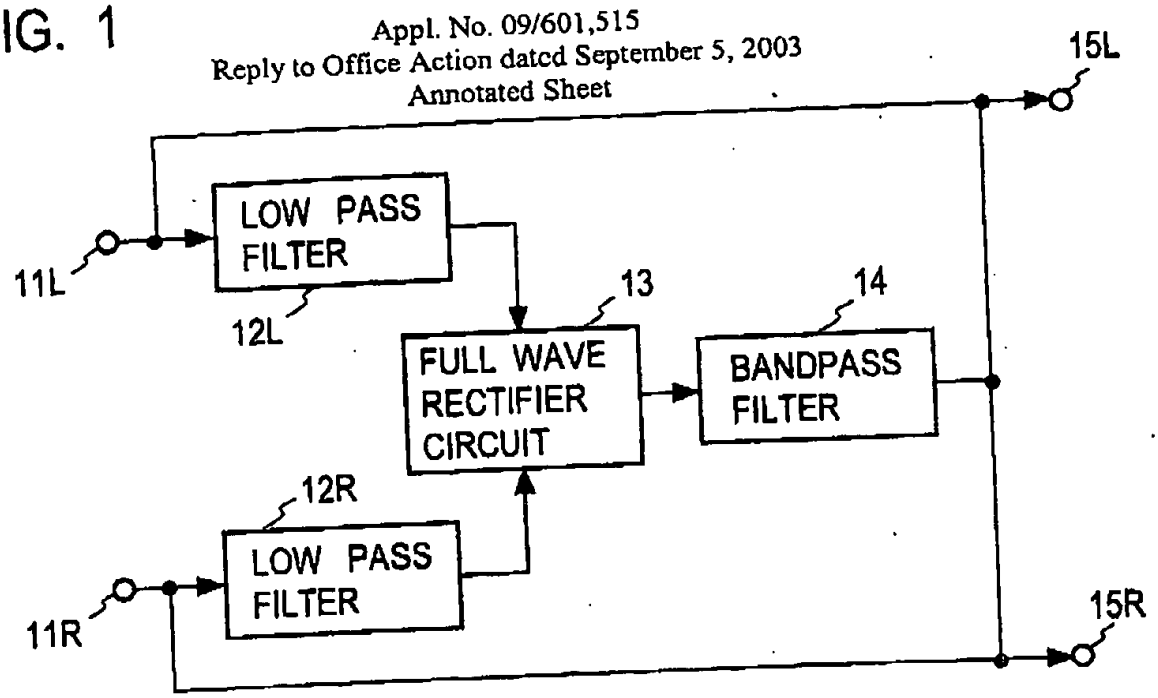
Respectfully submitted,

By _____

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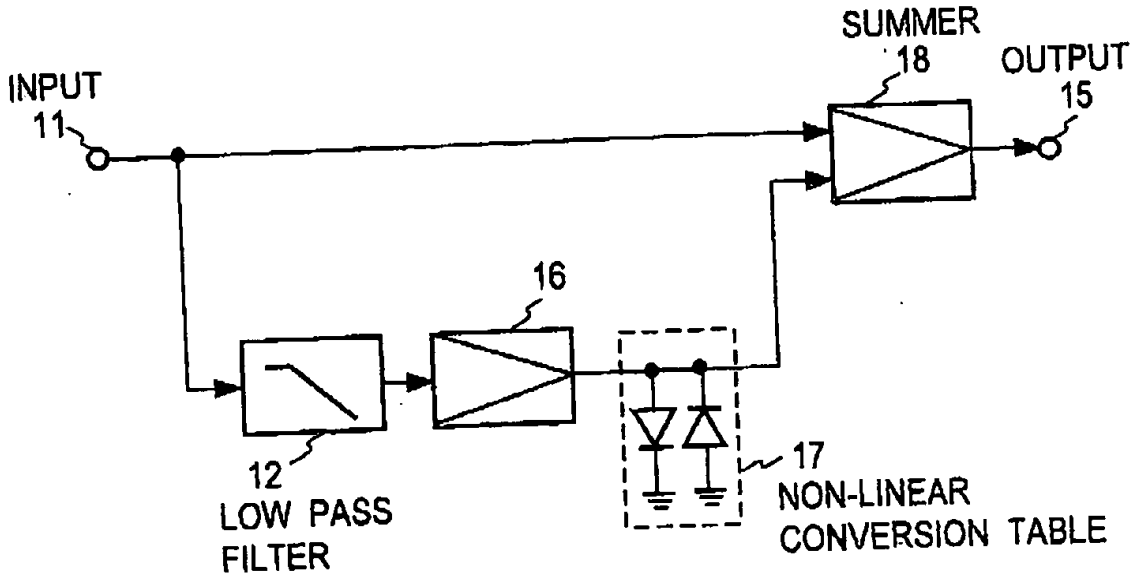
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FIG. 1



Prior ART

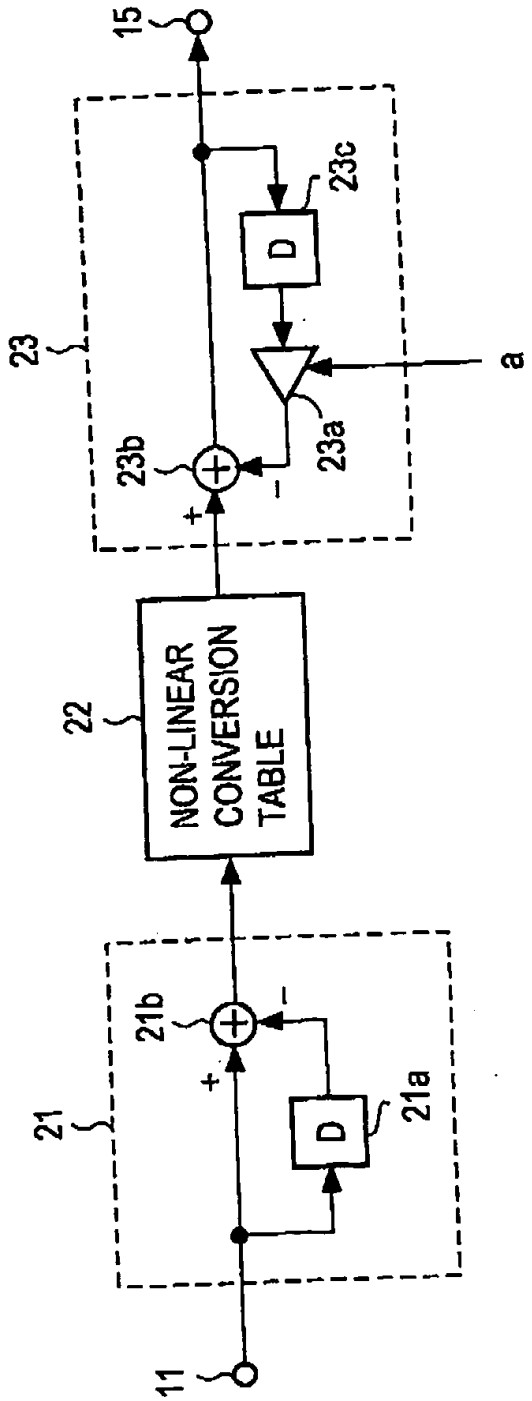
FIG. 2



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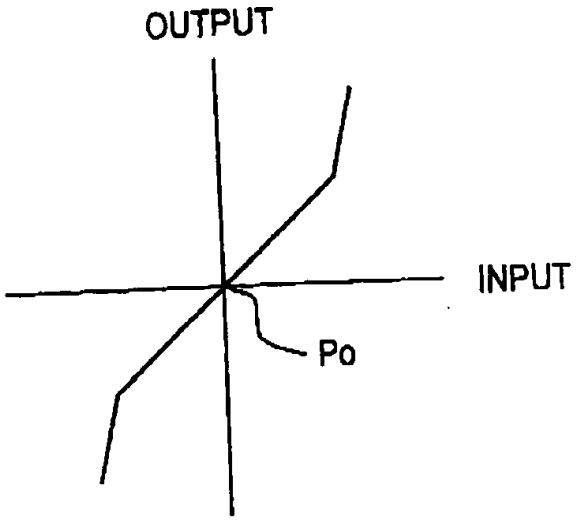
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Reply to Office Action dated September 5, 2003
Annotated Sheet



Prior Art

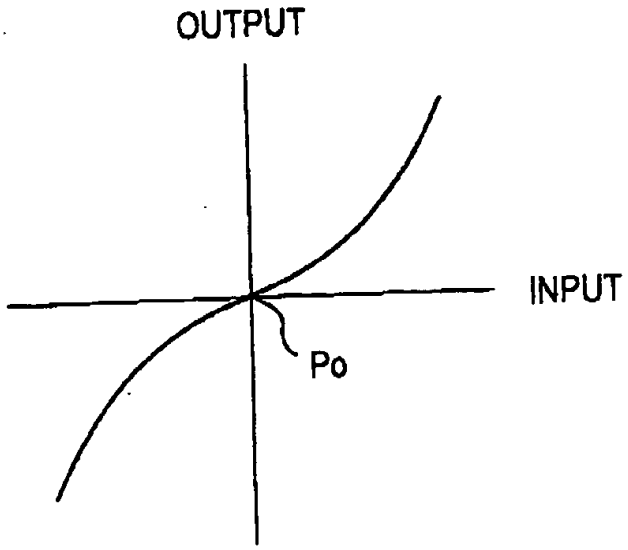
FIG. 3

FIG. 4A



Prior Art

FIG. 4B



Prior Art